

Claims

1. A machine dishwashing product in the form of a water-soluble pouch comprising a plurality of compartments in generally superposed or superposable relationship, each
5 compartment containing one more detergent active or auxiliary components, wherein said pouch has a volume of from about 5 to about 70 ml and a longitudinal/transverse aspect ratio in the range from about 2:1 to about 1:8.

2. A machine dishwashing product according to claim 1 wherein said pouch
10 comprises upper and lower generally opposing outer walls, a skirt-like side wall and one or more internal partitioning walls, and wherein each of said upper and lower outer walls and said skirt-like side wall are formed by a method selected from the group consisting of thermoforming, vacuum forming, and combinations thereof.

3. A machine dishwashing product according to claim 2 wherein each internal
15 partitioning wall is secured to an outer or side wall of said pouch along a single seal line or to both an outer and a side wall of said pouch along a plurality of seal lines that are at least partially non-overlapping.

4. A machine dishwashing product according to claim 2 wherein each partitioning
20 wall is secured to one or more outer or side walls by heat or solvent sealing.

5. A machine dishwashing product according to claim 2 wherein at least one internal
25 partitioning wall is secured to an upper or lower outer wall along a first continuous seal line and one or both of said outer wall and said partitioning wall are secured to the skirt-like side wall along a second continuous seal line and wherein said seal lines, in the case of heat seals, are essentially non-overlapping and in the case of solvent seals, are at least partially non-overlapping.

6. A machine dishwashing product according to claim 5 further comprising a
30 longitudinally-extending waist region defined by said first and second seal lines, said first seal line or non-overlapping portion thereof being situated inwardly of the second seal

line and longitudinally off-set therefrom, whereby said waist region and said skirt-like side wall are generally coextensive with one another.

7. A machine dishwashing product according to claim 1 comprising a plurality of
5 compartments in generally superposed relationship, each compartment containing one
more detergent active or auxiliary components, wherein the pouch comprises upper and
lower generally opposing outer walls, a skirt-like side wall and one or more internal
partitioning walls wherein at least one internal partitioning wall is secured to an upper or
10 lower outer wall along a first seal line and one or both of said outer wall and said
partitioning wall are secured to the skirt-like side wall along a second seal line and
wherein the seal lines are at least partially non-overlapping.

8. A machine dishwashing product according to claim 7 having a longitudinally-
extending waist region defined by said first and second seal lines, said first seal line or
15 non-overlapping portion thereof being situated inwardly of the second seal line and
longitudinally off-set therefrom, whereby said waist region and skirt-like side wall are
generally coextensive with one another.

9. A machine dishwashing product according to claim 1 wherein the plurality of said
20 compartments are in side-by-side but generally superposable relationship and wherein the
pouch comprises upper and lower generally opposing outer walls, one or more skirt-like
side walls and one or more external partitioning walls, and wherein each of said upper
and lower outer walls and skirt-like side walls are formed by a method selected from the
group consisting of thermoforming, vacuum forming, and combinations thereof.

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10. A machine dishwashing product according claim 1 wherein at least one of said
plurality of compartments comprises a powder composition.

30 11. A machine dishwashing product according to claim 10 wherein said powder
composition comprises particulate bleach.

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12. A machine dishwashing product according to claim 11 wherein said particulate bleach is selected from the group consisting of inorganic peroxides, organic peracids, and mixtures thereof; wherein said inorganic peroxides are selected from the group consisting of perborates, percarbonates, and mixtures thereof; and wherein said organic peracids are preformed monoperoxy carboxylic acids.

13. A machine dishwashing product according to claim 1 wherein at least one of said plurality of compartments comprises a liquid composition.

14. A machine dishwashing product according to claim 13 wherein said liquid composition comprises detergency enzyme.

15. A machine dishwashing product according to claim 1 wherein at least one of said plurality of compartments comprises a composition in paste form.

16. A machine dishwashing product according to claim 1 wherein at least one of said plurality of compartments comprises a composition in gel form.

17. A machine dishwashing product according claim 1 wherein at least one of said plurality of compartments comprises a composition in wax form.

18. A machine dishwashing product according to claim 1 wherein one or more of said plurality of compartments comprises an organic solvent system effective in removing cooked-, baked- and burnt-on soils.

19. A machine dishwashing product according to claim 18 wherein said organic solvent system is selected from the group consisting of alcohols, amines, esters, glycol ethers, glycols, terpenes, and mixtures thereof.

20. A machine dishwashing product according to claim 18 wherein said organic solvent system is selected from the group consisting of organoamine solvents, alcoholic solvents, glycols, glycol derivatives, and mixtures thereof; wherein said organoamine

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solvents are selected from the group consisting of alkanolamines, alkylamines, alkyleneamines, and mixtures thereof; wherein said alcoholic solvents are selected from the group consisting of aromatic alcohols, aliphatic alcohols, cycloaliphatic alcohols, and mixtures thereof; and wherein said glycols and glycol derivatives are selected from the group consisting of C₂-C₃ (poly)alkylene glycols, glycol ethers, glycol esters, and mixtures thereof.

21. A machine dishwashing product according to claim 18 wherein said organic solvent comprises organoamine solvent and glycol ether solvent in a weight ratio of from about 3:1 to about 1:3.

22. A method according to claim 21 wherein said glycol ether solvent is selected from the group consisting of ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, propylene glycol monobutyl ether, dipropylene glycol monobutyl ether, ethylene glycol phenyl ether, and mixtures thereof.

23. A machine dishwashing product according to claim 1 wherein each of the said plurality of compartments have a different disintegration rate or dissolution profile under in-use conditions.

24. A machine dishwashing product according to claim 23 wherein at least one of said compartments is made of a material which is substantially insoluble in cold water at or below about 20°C and soluble in warm water at or above about 30°C, wherein at least one other compartment is made of a material which is soluble in cold water at or below 20°C.

25. A machine dishwashing product according to claim 23 comprising a first compartment containing a liquid composition and a second compartment containing a powder or densified powder composition, said first compartment preferably being made of a warm water-soluble material and said second compartment preferably being made of a cold water-soluble material.

26. A machine dishwashing product according to claim 25 wherein said liquid composition comprises a detergency enzyme.

5 27. A machine dishwashing product according to claim 25 wherein said liquid composition comprises a surfactant.

10 28. A method of washing dishware/tableware in an automatic dishwashing machine, said method comprising the step of contacting said dishware/tableware with said dishwashing product of claim 1.

29. A process for making a water-soluble pouch and which comprises a plurality of compartments in generally superposed or superposable relationship, each comprising a detergent active or auxiliary component, the process comprising the steps of:

- 15 a) forming a first moving web of filled and optionally sealed pouches releasably mounted on a first moving endless surface;
- b) forming a second moving web of filled and sealed pouches releasably mounted on a second moving endless surface;
- 20 c) superposing and sealing or securing said first and second moving webs to form a superposed and sealed web; and
- d) separating said superposed and sealed web into a plurality of water-soluble multi-compartment pouches.

25 30. A process according to claim 29 wherein said second moving endless surface is moving in synchronism with said first moving endless surface.

30 31. A process according to claim 29 wherein said first web of pouches is prepared by forming and filling a first moving web of open pouches mounted on the first endless surface and closing the first web of open pouches with web closure means moving in synchronism therewith.

32. A process according to claim 29 wherein said first web of pouches is prepared by forming and filling a first moving web of open pouches mounted on the first endless surface and closing the first web of open pouches with the second web of filled and sealed pouches moving in synchronism therewith.

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33. A process according to claim 29 further comprising the step of inverting said second moving web prior to superposing and sealing said first and second moving webs to form said superposed and sealed web.

10 34. A process according to claim 29 wherein said pouches of the first moving web are horizontal or substantially horizontal during filling thereof.

35. A process for making a water-soluble pouch which comprises a plurality of compartments in generally superposed relationship, each comprising a detergent active or auxiliary component, the process comprising the steps of forming and filling a moving horizontal or substantially horizontal web of open pouches releasably mounted on a first moving endless surface and closing the web of open pouches with a superposed moving web of pre-formed, filled and sealed pouches moving in synchronism therewith.

20 36. A process according to claim 29 wherein said first endless surface is moving in continuous horizontal or substantially horizontal motion during the step of filling the first moving web of open pouches.

25 37. A process according to claim 29 wherein said first endless surface is moving in continuous horizontal rectilinear motion during the step of filling the first moving web of open pouches and wherein the step of filling is accomplished using a product filling station moving in synchronism with the first endless surface.

30 38. A process according to claim 37 wherein said product filling station comprises means for filling quantities of a plurality of product feed streams into each of said open pouches.

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39. A process according to claim 29 wherein said second web of formed, filled and sealed pouches is prepared by forming and filling a second moving web of open pouches mounted on the second endless surface and closing the second web of open pouches with film closure means moving in synchronism therewith.

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40. A process according to claim 29 wherein said pouches of the second moving web are horizontal or substantially horizontal during the filling thereof.

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41. A process according to claim 40 wherein said step of filling the second moving horizontal web of open pouches is accomplished using a second product filling station moving in synchronism with the second endless surface.

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42. A process according to claim 41 wherein said second product filling station comprises means for filling quantities of a plurality of product feed streams into each of said open pouches.

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43. A process according to claim 29 wherein said first endless surface is moving in horizontal rectilinear motion during the step of filling the first moving web of open pouches and wherein said second endless surface is moving in substantially horizontal rectilinear or curvilinear motion during the step of filling the second moving web of open pouches.

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44. A process according to claim 29 wherein said second endless surface rotates in a direction counter to said first endless surface.

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45. A process for making a water-soluble pouch which comprises a plurality of compartments in generally superposed or superposable relationship, each comprising a detergent active or auxiliary component, the process comprising the steps of:

a) forming and partially filling a moving web of open pouches releasably mounted on a moving endless surface;

b) closing and sealing said moving web with web closure means moving in synchronism therewith whereby the web closure means is introduced into the

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partially filled pouches so as to form a plurality of closed and superposed open compartments;

- c) filling, closing and sealing the superposed open compartments by means of a second web closure means moving in synchronism with said moving web; and
- 5 d) separating said web into a plurality of water-soluble multi-compartment pouches.

46. A process according to claim 45 wherein said sealing steps are undertaken by means of solvent sealing.

- 10 47. A process for making a water-soluble pouch which comprises a plurality of compartments in generally superposed or superposable relationship, each comprising a detergent active or auxiliary component, the process comprising the steps of:

- a) forming and partially filling a moving web of open pouches releasably mounted on a moving endless surface;
- 15 b) closing said moving web with web closure means moving in synchronism therewith whereby the web closure means is introduced into the partially filled pouches so as to form a plurality of closed and superposed open compartments;
- c) filling and closing the superposed open compartments by means of a second web closure means moving in synchronism with said moving web;
- 20 d) sealing said web and said first and second web closure means; and
- e) separating said web into a plurality of water-soluble multi-compartment pouches.

48. A process according to claim 47 wherein said sealing step is undertaken by means of ultrasonic sealing.

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49. A process according to claim 45 wherein said web of open pouches in step (a) is filled with a first composition comprising a detergent active or auxiliary component and wherein the composition is densified or the pouches enlarged before closing said moving web in step (b).

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50. A process according to claim 49 wherein said first composition is a powder composition and wherein said composition is densified by compaction.

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51. A process for making a water-soluble pouch which comprises a plurality of compartments in generally superposed or superposable relationship, each comprising a detergent active or auxiliary component, the process comprising the steps of:

- 5 a) forming and filling a moving web of open pouches releasably mounted on a moving endless surface;
- b) closing and sealing said moving web with web closure means moving in synchronism therewith so as to form a plurality of closed compartments;
- c) forming a recess within some or all of the closed compartments formed in step (b)
10 so as to generate a plurality of open compartments superposed above the closed compartments;
- d) filling, closing and sealing the superposed open compartments by means of a second web closure means moving in synchronism with said moving web; and
- e) separating said web into a plurality of water-soluble multi-compartment pouches.

52. A process for making a water-soluble pouch which comprises a plurality of compartments in generally superposed or superposable relationship, each comprising a detergent active or auxiliary component, the process comprising the steps of:

- 20 a) forming and filling a moving web of open pouches releasably mounted on a moving endless surface;
- b) closing said moving web with web closure means moving in synchronism therewith so as to form a plurality of closed and superposed open compartments;
- c) forming a recess within some or all of the closed compartments formed in step (b)
25 so as to generate a plurality of open compartments superposed above the closed compartments;
- d) filling and closing the superposed open compartments by means of a second web closure means moving in synchronism with said moving web;
- e) sealing said web and said first and second web closure means; and
- f) separating said web into a plurality of water-soluble multi-compartment pouches.

53. A process according to claim 45 wherein said endless surface is moving in continuous horizontal or substantially horizontal motion during the steps of filling the open pouches and superposed open compartments.

5 54. A process according to claim 45 wherein said endless surface is moving in continuous horizontal rectilinear motion during the steps of filling the open pouches and superposed open compartments, and wherein the steps of filling are accomplished using a product filling station moving in synchronism with the endless surface.

10 55. A process according to claim 50 wherein said product filling station comprises means for filling quantities of a plurality of product feed streams into each of said compartments.

15 56. A process according to claim 29 wherein a plurality of compartments is filled with a powder composition and wherein a plurality of superposed compartments is filled with a liquid, gel or paste composition.

20 57. A process according to claim 29 for forming a plurality of multi-compartment pouches in a multiplicity of sensorially distinctive groups, the process comprising filling and sealing each of a multiplicity of compartmental groups with a corresponding sensorially distinctive composition, whereby the resulting groups are distinctive in terms of colour, shape, size, pattern or ornament, or wherein the groups are distinctive in terms of providing a unique sensorial signal such as smell, sound, feel, etc.

25 58. A method of washing dishware/tableware in an automatic dishwashing machine using the water-soluble pouches make according to the process of claim 25.

30 59. A display pack comprising a see-through container which contains a plurality of unit-doses in the form of water-soluble pouches in a multiplicity of sensorially distinctive groups, each pouch being a product according to claim 1 or made according to the process of claim 29.

60. A display pack comprising a see-through container comprising a plurality of unit-doses of a detergent product in a multiplicity of sensorially distinctive groups, and wherein the groups are distinctive in terms of colour, shape, size, pattern or ornament, and wherein the groups are distinctive in terms of providing a unique sensorial signal.

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61. A display pack according to claim 59 wherein the number of said unit-doses is at least about 10 and wherein the number of sensorially distinctive groups is at least about 2.

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62. A display pack according to claim 59 wherein at least two groups are visually distinctive in terms of colour.

63. A display pack according to claim 59 wherein at least two groups are distinctive in terms of perfume.

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